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Food Policy 70 (2017) 27–39

Contents lists available at ScienceDirect

Food Policy

journal homepage: www.elsevier.com/locate/foodpol

Explaining the reduction in child undernutrition in the Indian state of Maharashtra between 2006 and 2012: An analysis of the policy processes

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ARTICLE INFO

Article history:
Received 29 April 2016
Received in revised form 10 April 2017
Accepted 14 May 2017

Keywords:
Nutrition
Governance
Policy analysis
Policy processes
Qualitative research
Leadership

ABSTRACT

The Indian state of Maharashtra has been lauded as a 'success story' for its rapid and significant decline in undernutrition amongst children. Between 2006 and 2012, childhood stunting fell from 39 to 24%. Whilst the global policy and academic literature strongly emphasises the need to act on nutrition, there are still too few studies outlining the policy processes which been part of successful state-led strategies – particularly at a sub-national level. This study is intended to contribute to future policy via unpacking the unfolding story of policy and programme attention to nutrition. Stakeholder perceptions and opinions on the wider policy, political and contextual reasons for Maharashtra's decline in child undernutrition were sought and used alongside documentary evidence to construct a chronology of key events. Key factors identified via this process include the way in which issue framing and evidence helped catalyse a political response; the particular governance structures employed in response (the State's 'Nutrition Mission') and the way in which leadership and a focus on system-wide capacity combined in an innovative fashion to focus resources on pockets of deprivation in high-burden areas.

1. Introduction

An estimated 159 million children are affected by chronic undernutrition globally (International Food Policy Research Institute, 2016, p. 2). Undernutrition has been shown to significantly increase the risk of morbidity and mortality and can have irreversible and lifelong consequences on physical, mental and cognitive development of a child; with inadequate growth and nutrition in mothers also transferred to the next generation in the form of already stunted neonates (Black et al., 2013). Effective interventions exist to tackle undernutrition at an immediate level (e.g. breastfeeding promotion, etc.) (Bhutta et al., 2013) which, alongside wider changes in 'underlying' drivers (Ruel and Alderman, 2013; Smith and Haddad, 2015), could result in significant gains in nutritional status and other health and economic benefits if implemented at scale. However, there is a consensus on the need for better evidence on how to scale up these interventions and how to sensitise wider development to nutrition more effectively (Gillespie et al., 2013; Ruel and Alderman, 2013). Only then will newly agreed global targets to reduce undernutrition be achieved.

The Indian state of Maharashtra offers one of the most prominent examples of a populous state achieving a rapid and significant decline in undernutrition amongst children. Between 2006 and 2012 the prevalence of child undernutrition dropped dramatically. Childhood stunting (low height for age – a key measure of chronic developmental difficulties) fell from 39 to 24%, as measured by two state-wide surveys (International Institute for Population Sciences, 2013; International Institute for Population Sciences and Macro International, 2007). This was a decline of nearly 3 percentage points per year. This puts Maharashtra amongst the most successful states to have tackled childhood undernutrition. Understanding the situation in Maharashtra helps fill a gap in studies at a sub-national level. But with a population of 112 million people,[1] the state also represents an important case of how to tackle undernutrition at scale.

The original and primary question the study set out to ask is 'what factors were perceived by stakeholders to have contributed to the decline in stunting in the state during this period (2006–2012)?'. Two studies have traced factors associated with the stunting decline via multivariate analysis of the data available in state surveys. When controlling for other factors, such analysis found, in one study: correlations of lower stunting with mother's literacy; higher age at first pregnancy; more antenatal visits; birthplace in a

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[1] At last census in 2011.

http://dx.doi.org/10.1016/j.foodpol.2017.05.006
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facility; and women's wealth (Haddad and Valli, 2014) and in both studies: correlations with higher birthweight; key infant feeding practices - including minimum meal frequency and dietary diversity; maternal stature; improved sanitation and improvements in household wealth (Aguayo et al., 2016; Haddad and Valli, 2014). This study is intended to complement these quantitative studies in considering the wider policy and programmatic factors which together might constitute an 'enabling environment' for stunting reduction in the state (Gillespie et al., 2013). To achieve this, semi-structured interviews with purposely selected stakeholders were undertaken in order to construct a chronology of factors they identified as key to the decline; key documentary evidence related to this period was examined; and analysis was undertaken within a wider framework that has been employed to describe those factors conducive to an enabling environment for action on nutrition elsewhere (Gillespie et al., 2013).

2. Conceptual framing and methodology

The UNICEF framework on the determinants of child and maternal undernutrition distinguishes between three levels of causes: immediate, affecting the individual (including disease and insufficient food intake); underlying, affecting the community and household (including food security, social and care environments, access to health services and safe water and sanitation); and basic (social, political, economic), or structural/societal levels. Recent evidence on undernutrition, including that summarised in the most recent (2013) Lancet series on undernutrition, has highlighted how this multi-causal aetiology calls for a multisectoral approach in policy and programming and a concerted effort to turn policy momentum into action on the ground (Gillespie et al., 2013).

To better understand the factors shaping such efforts, a framework for such 'enabling environments' for nutrition was brought together as part of a series in *The Lancet* (Gillespie et al., 2013). The framework drew on both existing theory and country case studies, following a review over 50 papers. The authors argued that analysing policy, political or programmatic structures is critical to understanding not only the emergence of the basic determinants of undernutrition, but also the policy decisions and effective implementation of programmes designed for its redressal. The framework brought such factors together under three broad headings: (1) the framing, generation and communication of knowledge and evidence; (2) the political economy of stakeholders, ideas and interests; and (3) capacity (individual, organisational and systemic) and financial resources (Gillespie et al., 2013).

The framework offers an advantage in providing a relatively simple way of approaching nutrition policy and politics whilst summarising a broader and more detailed theoretical and empirical literature which has been concerned with similar issues of nutrition or health policy processes. Such literatures speak, for example, of:

(1) the importance of credible data and evidence, alongside existing internal and public 'framing' of issues as being severe and amenable to policy response (e.g. (Pelletier et al., 2012, 2011; Reich, 1995; Reich and Balarajan, 2012; Shiffman, 2010; Shiffman and Smith, 2007));
(2) the requirement for considerable political will and commitment (e.g. Heaver, 2005) and effective governance structures, including the need for several sectors to work together in adequate 'horizontal' or multisectoral co—ordination (Harris and Drimie, 2012; Garrett and Natalicchio, 2010; Harris and Drimie, 2012) at the same time as demonstrating 'vertical' co-ordination – i.e. between different administrative levels ((Mejia Acosta and Fanzo, 2012); and
(3) the importance of capacity development at all levels (individual, organisational and systematic – Potter and Brough, 2004) - including the development of leadership at an executive level (Mejia Acosta and Fanzo, 2012) and wider workforce and implementation capacities (Fanzo et al., 2015; Menon et al., 2014). Others have also brought a number of these factors together to indicate the factors necessary for strategic system wide capacity, commitment and action (Pelletier et al., 2012, 2011) and for effective 'scale-up' of programmes to reach populations at scale (Gillespie et al., 2015; Menon et al., 2014).

We adopted this combination of frameworks (the original UNICEF framework and the enabling environment framework – hereafter 'Lancet framework') both to help identify stakeholders and to group their responses into meta-themes suitable for analysis of the processes at play in Maharashtra as we develop and further analyse a chronology of events of this time. A further explanation of our coding process below, alongside the presentation of our findings in Fig. 5, highlights how this literature was used to inform our approach.

2.1. Study design and data collection

The qualitative research for this study was carried out in Mumbai and Pune and at district level in Thane, Nagpur and Amravati in the Indian state of Maharashtra between September and November 2013. The selection of stakeholders for the study and the topics to be covered in the interviews were guided by the sectors indicated in the UNICEF framework, to ensure adequate multi-sectoral representation of stakeholders. The selection of both organisations and appropriate individual stakeholders (within and outside of organisation) was carried out in consultation with the project team, the local sponsors (UNICEF) and other local experts. Fig. 1 illustrates how different types of organisations and individuals were categorised according to this schema.

Twenty four key stakeholder interviews and a further four Focus Groups Discussions (FGDs) were conducted at district level (the latter comprising frontline workers and civil society activists). Because the data were collected in two rounds, this enabled the research team to prioritise stakeholders in the second round and target stakeholders not yet represented in sectors depicted in Fig. 1. Continual consultation between the team and snowballing recommendations from interviewed stakeholders allowed confidence that major stakeholders and sectors were well represented.[2] Semi-structured interviews were selected as they enabled the team to probe in a standardised way for key factors identified in the UNICEF and Lancet frameworks, but also allowed for the discovery of unanticipated and emerging themes and events of relevance. FGDs were chose for district level work due to the short time available for the research team in the field and because it would also allow frontline workers to have confidence in sharing experience in a group. Interviews and FGDs were conducted in person by at least one or two of the authors accompanied by a Hindi and Marathi speaking research assistant using a semi-structured interview guide. All interviews lasted between 45 minutes and 2 hours. Interviews were conducted in English (the majority), Hindi or Marathi. They were recorded digitally and transcribed verbatim (and translated into English if necessary). All stakeholders consented to be interviewed and were guaranteed anonymity and confidentiality. Ethical approval was obtained via the Institute of Development Studies' ethical review committee.

[2] The research team were fortunate in being able to access nearly all those approached for interview. Only one stakeholder identified as a key informant due to their role in the events described here was unable for interview.

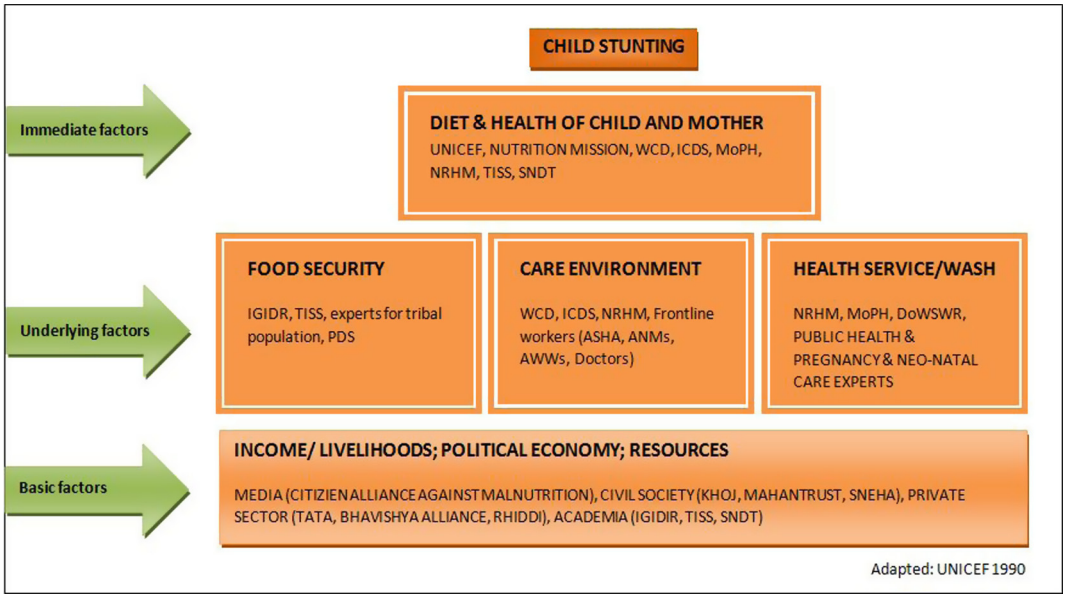

Fig. 1. Schematic guiding stakeholder selection for interview.

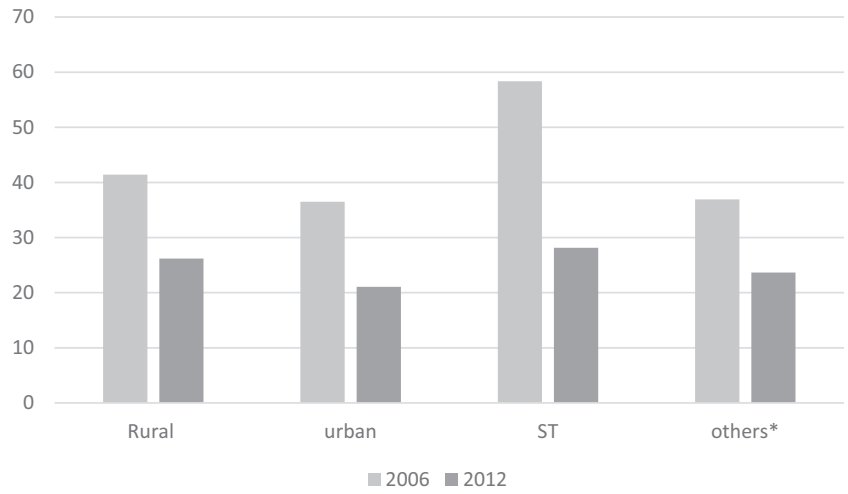

Fig. 2. Stunting by Rural/Urban and ST Status. * Note, there was also a very small number of respondents who reported as 'no caste/tribe' and figures are not reported here. *Source:* Haddad (2014).

2.2. Data analysis

For analysis of the policy and programmatic changes, an inductive content analysis approach was employed which included both *a priori* and open coding (Sandelowski, 2000) of transcripts of interviews and FGDs. Three transcripts were read carefully line-by-line by the two authors and initial codes were developed and discussed based on both the open coding (Hardy and Bryman, 2009; Morgan, 1993) and the *a priori* selected themes. After this stage, an initial coding scheme was developed that guided the coding of the remaining transcripts. The initial coding scheme included themes selected from the wider set of factors identified in both the UNICEF and Lancet frameworks. Summative or meta-themes (Magilvy and Thomas, 2009) were decided in accordance with the broader UNICEF factors and then the three categories of enabling environment factors identified in Gillespie et al.; and then populated with key thematic categories from this framework (including e.g. references to framing; political will; or leadership). Not all the factors present in the original Gillespie et al. framework were present in the interview transcripts and hence in initial coding (our observation is that this framework is not intended as a checklist, merely a guide to factors likely to be present based on a reading of the existing literature). If codes later emerged (these tended to be on events, programmes and actors rather than additional theoretical concerns, which were well covered in the original framework), we went back to the initially coded transcripts and checked for the relevance of these additional codes. A summary of key meta-themes used in the analysis is provided in Fig. 4.

A key focus of the empirical data collected was the overarching story of what happened in Maharashtra, both leading up to and including the period of stunting declines, within these stakeholder perspectives. To supplement stakeholder perspectives, a review of published and 'grey' literature was conducted prior to the fieldwork and was supplemented by additional unpublished documents made available by stakeholders during the fieldwork period and further follow up. Key dates and activities in the

Immediate and underlying	– Improved child feeding practices (in particular breastfeeding) – Improved household food security and access to more nutritious diets – Improved access to primary health care and reproductive care – Universalistion of ICDS and improved quality of service delivery – Improved transport and communication infrastructure even in remote rural areas – Improved access to clean water and sanitation
Basic	– Economic growth and increase in per capita income – Growing number of public social and health programmes – Globalisation and improved access to markets including in remote rural areas – Media expansion and improved 'access to the outside word' – A historically strong civil society – Improved education and female empowerment – Strong political commitment towards undernutrition reduction (e.g. increased budgets for nutrition & health) – Implementation of the Nutrition Mission (immediate, underlying and basic factors)

Fig. 3. Factors perceived critical at immediate, underlying and basic levels.

chronology of events are captured in Fig. 4, which is reconstructed from stakeholder accounts, the written account of one of the key participants who was also interviewed (Ramani, 2011) and these other sources (which include grey literature, newspaper and magazine articles and court records). Both this chronology and the wider findings reported here were checked with a sub-set of stakeholders, including state bureaucrats and retired employees associated with the events and with research colleagues with a good knowledge of the state and its nutrition policy landscape.

3. Findings

3.1. Background and chronology of events

Maharashtra is the second largest state in India, with a population of 112 million recorded in the 2011 census. At an aggregate level it is a wealthy state, ranking first amongst Indian states in GDP/capita. It achieves medium performance on a number of governance and social spending indicators (Haddad, 2014) and performs relatively well on women's health and wider health indicators (Haddad, 2014). However, the majority of the population are still employed in agriculture, where growth has been poor – and the state's wealth belies a bias towards Mumbai and other urban centres and policies in favour of dominant rural castes and urban upper castes (Deshpande, 2010). Economic and agricultural growth as a result are highly skewed and; combined with a diverse geography; have led to high levels of inequality and uneven development throughout the state which affect in particular indigenous 'tribal' populations (categorised by the government of India as 'scheduled tribes' (ST)) and *Dalit (*or 'scheduled caste' (SC)) populations. Fig. 2 shows the consistently higher prevalence of stunting amongst these groups as compared to the rest of the population – and the particularly high gap which existed in 2006 compared to 2012.

Understanding this context for the state's ST population is critical for understanding the political response to undernutrition over the past 10–15 years and which shaped the response between the two survey periods.

Most participants traced the origins of the political focus to a number of child deaths of children in ST communities which occurred as a result of acute undernutrition in Aurangabad district in September 2001. Various civil society organisations or activists were reported to be already working in the region and were able to work effectively with the media to bring political and public attention to the issue. Key amongst these were the NGO SPREAD, which published a report in November of that year in the local language, *Marathi*, which highlighted the fact that child deaths had been systematically underreported (Bavadam, 2005).

The civil society and media led framing of the issue of malnutrition in terms of the unacceptability of child deaths led to a swift response from the government and to specific commitments from the state's Chief Minister (CM) to tackle the problem. Some stakeholders remarked that the issue had become a political embarrassment as the deaths had occurred in his electoral district.

At a local level the Divisional Commissioner, Mr. V. Ramani, convened a workshop, drawing on support from UNICEF and the experience of officials who had launched similar programmes in the state of Odisha. An outcome of the meeting was the launch of the Malnutrition Removal Campaign, which also became known as the Marathwada initiative, which was designed to be the State's primary response to the causes and treatment of the child deaths in the district and to strengthen provision via the government's community nutrition programme, the Integrated Child Develop-

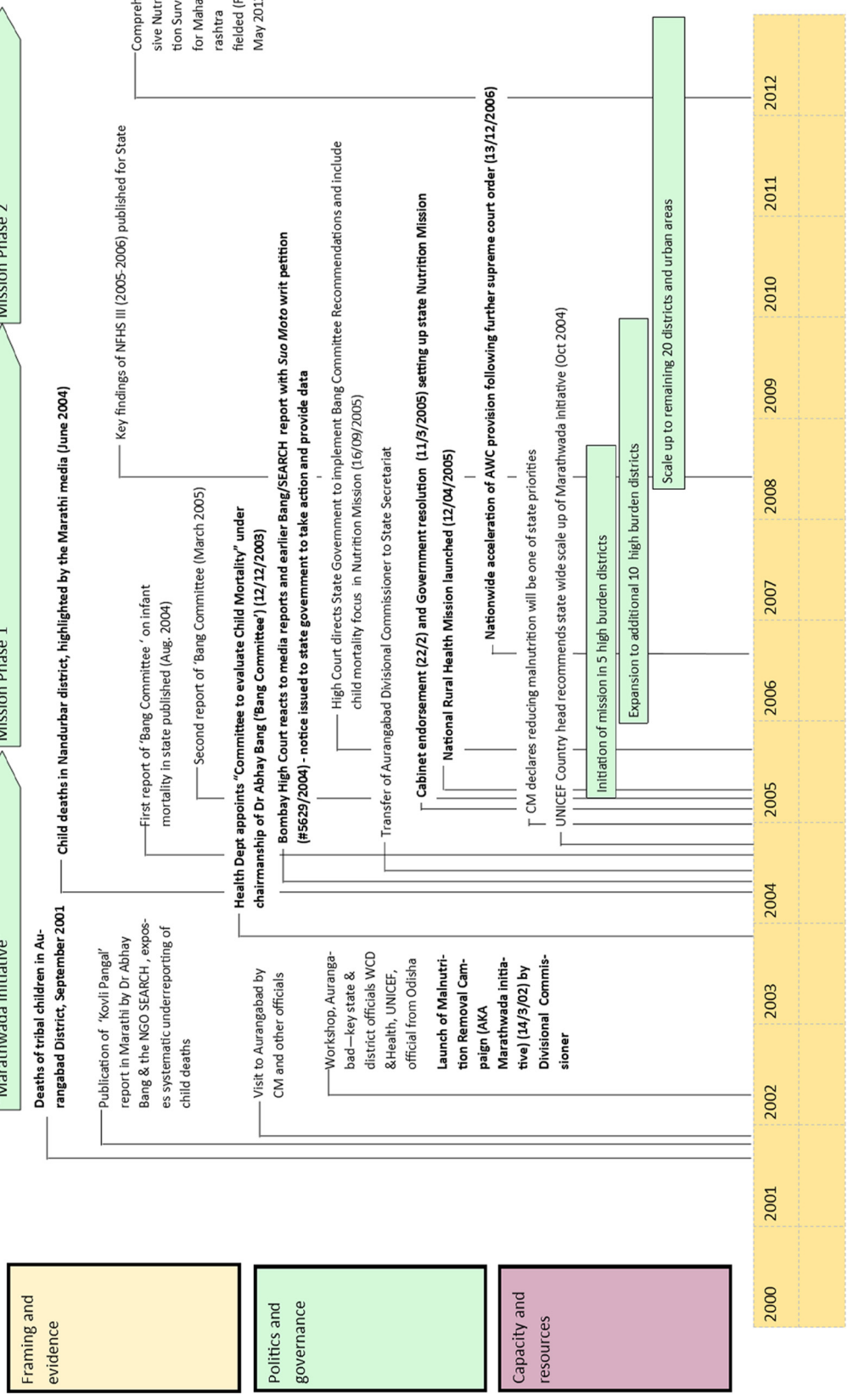

Fig. 4. Chronology of policy and political events shaping Maharashtra's response to child malnutrition.

ment Services (ICDS - see Box 1). The programme focused on improved growth monitoring, community level counselling, timely onward referral of acute cases and training and sensitisation of local workers and officials.

Box 1 The Integrated Child Development Services (ICDS) and the National Rural Health Mission (NRHM). The ICDS, launched in 1975 and since 2004 'universalised' to all Indian communities, is intended to provide integrated health, nutrition and education services to pre-school children, consisting of: supplementary nutrition; growth monitoring; maternal and female health counselling; immunization; wider health and referral services and pre-school education. The scheme is known to experience substantial problems in implementation (Gillespie and Measham, 1998; Gragnolati et al., 2005). Its 'universaliation' was the result of civil society and legal activism on child nutrition and security as part of the 'Right to Food' campaign. (A result of this campaign was a Supreme Court interim order in 2001, which mandated that the scheme should be available to all communities with more than 50 households. In 2004, the court asked the Government of India to report on progress and a timetable to ensure sufficient coverage. A further order in December 2006 mandated this scale up to have taken place by December 2006 (for further details see (Comptroller and Auditor General of India, 2012).

The NRHM has been accompanying ICDS in rural communities since 2005. It is a national initiative, which aims to strengthen rural health services and delivery within the community. Intended services with relevance to nutrition include a focus on women and children's health; incentivising institutional delivery; and strengthening community level contact through incentive based payments to village based 'Accredited Social Health Activists' (ASHAs) (for more details see panel 2 in (Balarajan et al., 2011, p. 511). The ways in which the NRHM and the ICDS are working together has also become a key focus of the literature focusing on multisectoral co-ordination or 'convergence', particularly at a community level (see e.g. (Avula et al., 2015)). Note the NRHM is now renamed 'National Health Mission' but is referred to here in its older form as was current during the activities and interviews described here.

The initiative was reported to have been seen as a success, but a number of child deaths elsewhere (including e.g. in 2004 in Nandurbar district), continued to keep the issue within the media and political gaze, particularly following a concerted campaign in the Marathi media in June 2004 (Bavadam, 2005; Ramani, 2011). An earlier government reaction to the issue was the initiation of a "Committee to evaluate child Mortality" in December 2003 under the chairmanship of Dr. Bang (Ramani, 2011). Meanwhile, the wider concerns highlighted in the media, led to concerned judges in the High Court of Bombay issuing a *Suo Moto Writ Petition against the State of Maharashtra*,[3] in July 2004, citing the child deaths and Dr. Bang's earlier (2001) report (Bavadam, 2005). The Bang committee issued its two reports in August 2004 and March 2005, underlining the earlier claims of systematic underreporting and recommending the government focus on ensuring all communities gained access to community nutrition provided by the ICDS and that the focus be on home visits to promote better care and feeding of children 0–2 (Ramani, 2011). Against this heightened political backdrop, the CM declared reducing malnutrition would be one of the Government's "leading priorities" and a number of the proponents of Marathwada, including Mr. Ramani (who had now been transferred to the state secretariat) were able to put it forward as a scalable solution to the state's nutrition problems, which was helped by the endorsement of the UNICEF country representative in October 2004 (Ramani, 2011). In February 2005 the State's Cabinet voted to establish a state-wide Nutrition Mission, formally titled the Rajmata Jijau Mother-Child Health and Nutrition Mission. This became the government's main response to the High Court, which in September directed the Government to implement the Bang committee's recommendations in full and, in particular, include a child mortality focus in the mandate of the Nutrition mission (Bavadam, 2005). The mission initiated its work in November 2005 under the leadership of Mr. Ramani.

The Mission proceeded in two phases in the period between the two surveys. The first phase extended the Marathwada initiative's activities to a number of districts with high burdens of undernutrition and largely ST populations (five in 2005 and another ten in 2006), before being scaled up to the whole state in 2008. Improved coverage and performance of growth monitoring (with enhanced community participation) was accompanied by a focus on frontline workers (who received training on Infant and Young Child Feeding), regular deworming and vitamin A supplementation and the establishment of new treatment protocols with the ability to refer to facility based Child Development Centres (CDCs) or community based Village Child Development Centres (VCDCs). Importantly, frontline provision now included the community level workers functioning as part of the state's implementation of the National Rural Health Mission (NRHM – see Box 1). A second five year phase began in 2010 and was mandated to continue the activities of the first phase but to include a stronger focus on the critical 'first 1000 days' between a child's conception and the age of two, to which evidence points as being the most effective period for long lasting impact on physical and cognitive development. This focus brought with it new activities focusing on maternal, neonatal and adolescent girl health, reproductive rights and links into wider government programmes.[4]

4. Perceived overarching factors for the stunting decline

The majority of the interviewees indicated that they felt that multiple factors had been responsible in the decline in stunting rather than any one. Amongst the most common factors listed were the state's economic growth, its improvement in social and health services and, in particular the role of the Nutrition Mission and the National Rural Health Mission. But a wider range of factors were cited amongst the different interviews including improvements in household food security, the impact of globalisation and a historically strong and active civil society. The full range of factors advanced by stakeholders are listed in Fig. 3, which groups them according to immediate and underlying and basic factors in the UNICEF framework. Below we discuss the factors perceived as most significant by interviewees in terms of the enabling environment behind these basic, immediate and underlying level changes.

5. Analysis of the enabling environment

As well as providing a chronology, Fig. 4 starts to categorise events into key themes of an enabling environment for nutrition. This has only been loosely pursued in the diagram, given the overlap between these themes (ie whether an event can be attributed to having contributed to framing and evidence, or to politics and governance structures, or to both). But broadly, it is possible to see how the initial framing of particular events, available evidence and media portrayal led to a political and governance response (the

[3] A legal term meaning of the court's own initiation, rather than responding to a public writ.

[4] A full description of the Mission's activities in both phases is contained in Ramani (2011).

Codes	Definition	Findings
1. Framing, generation and communication of knowledge and evidence		
Belief in credibility of data	This includes stakeholders' perception of the reliability of the data collected in the 2012 and other state-level surveys.	The data were found to be reliable by the majority of stakeholders (although some wondered the stated improvements were representative of tribal communities). Locally collected data, such as the 2012 Comprehensive Nutrition Survey of Maharashtra, was deemed particularly important.
Internal Framing	How the nutrition community frame the problem, evidence and possible actions internally	Not seen as fractious – however, some discussion over different standards and measures of undernutrition: stunting vs wasting – use of Indian Academy of Pediatrics (IAP) standards.
External Framing	Changes in public framing – how nutrition is discussed externally to the nutrition community or how nutrition community presents nutrition externally.	Malnutrition has been successfully framed as an important health issue in the state, due to the focus on child deaths. However a focus on food and short termism (rather than nutrition's multisectoral aetiology) predominates.
Perceived role of evidence & research	Includes evidence on the impact of direct nutrition interventions, the negative impact of child undernutrition	Global evidence was seen as important, with UNICEF having seen as acting as a conduit for evidence and research, shifting focus to e.g. conception and early childhood ('first 1000 days') and maternal nutrition
2. Political economy of stakeholders, ideas and interests		
Horizontal / multiesectoral coordination issues	This include any perceived coordination between sectors	The Mission and its staff were seen as instrumental in co-ordination at a State Secretariat level, with evidence also provided of such co-ordination on the ground. Co-ordination was officially between a wide range of departments, but stakeholders spoke commonly of the unprecedented level of co-ordination between the WCD and Health Departments
Vertical coordination	e.g. between levels in an organization (ie between policy design and practice) or different levels of government (national, state, division, district, etc)	The Mission was seen as successful in using the WCD and Health Departments 'machinery' (ie operational functions via key programmes) in linking policy the ground level. A wider focus on divisional and district capacity/motivation (see 'organisational capacity' below) was also seen as important in this respect
References to accountability, participation, community involvement	This included any reference to participation and accountability mechanisms and how they work on the ground.	Mission staff felt that participatory growth monitoring techniques had been key to village level changes. Wider accountability instruments were not mentioned, though see 'perceived civil society involvement', below
Perceived private sector involvement in nutrition	This included any experience, opinion about the contribution of the private sector to nutrition.	The private sector was not felt to have been a strong driver of nutritional change other than in contributions to wider economic growth. The Bhavishya Alliance (an alliance between Synergos, Unilever, UNICEF and others) was mentioned as having existed in this period but not likely to have contributed to state-wide changes.

Fig. 5. Table of key 'enabling environment' themes used for coding and summary of findings.

Judicial action, the Bang committee and the Nutrition Mission), which itself led to a focus on state-wide and ground level capacities and resources (which are described in more detail below). We follow this sequence in further analysing stakeholder views below, whilst noting, as Fig. 4 also confirms, that the sequence of events was not as linear as this would suggest. In fact, we witness a constant dialogue occurring throughout the process between evidence and framing, governance, ground level action and capacity, which fed back to a policy level. Key points pertinent to the evolution of events are drawn out below and are further summarised in Fig. 5.

5.1. Framing, generation and communication of knowledge and evidence

Participants noted several ways in which the actions of the various actors at state and local levels had made use of knowledge and

Perceived civil society involvement	This included the involvement of activists, NGOs, local groups, and other local movements in nutrition advocacy and other relevant activities	Civil society – particularly grassroots activists active in the areas associated with the 2001 and 2004 tribal deaths, alongside national initiatives such as the Citizen's Alliance against Malnutrition were seen as key in bringing the issue of malnutrition to the forefront of the political agenda and to the attention of the media and the Bombay High Court
External involvement	e.g. donors. May overlap with 'evidence'.	UNICEF were seen as critical to supporting the mission (via supporting evidence and resources) and the Mission's unique set up as part of government and yet removed from a number of bureaucratic hurdles
Media	Role of the media in highlighting nutrition as an issue	The media were seen as key in taking forward issues originally raised by civil society activists and propelling them into the public gaze – but at the cost of long-term and complex understandings
National level initiatives	Role of Gov of India including e.g. national level ICDS reforms	National level ICDS reforms mentioned in the context of 'universalisation'. Roll-out of the NRHM seen as critical to success. Wider social schemes including e.g. PDS and NREGA mentioned, but not seen as the strongest contributors to nutritional change.
3. Capacity and financial resources		
Perceived leaders in nutrition (individuals; organisations)	All named individuals and any reflections on their competencies (knowledge, skills, attributes)	Strong references to leadership of Chief Minister, all the staff associated with the Mission (and particularly its first Director General, Mr Ramani) – and leadership as existing all the way through the system, including local level bureaucrats and frontline workers. Mission staff noted for their ability to get out and inspire, but also focus on data, evidence and innovative approaches/systems.
Organizational capacity for nutrition	This included issues around frontline capacity, technical capacity at different levels (e.g. ICDS, ASHA, doctors)	The combination of the Mission, ICDS 'universalisation' and the NRHM were all seen as important in increasing organisational capacity and, in particular, resources at the frontline. The Mission in particular concerned itself with capacity building at all levels.
Systemic capacity	the ability of / constraints to individuals and organisations to function as an effective system – (so overlaps with e.g. horizontal and vertical co-ordination).	The Mission was seen as important in enabling health and nutrition structures to come together under a wider political and media focus on the causes and programmatic approaches to nutrition; and wider data and evidence. This all helped enhance systemic capacity, alongside wider approaches in the state to help build organisational capacity, such as e.g. inclusion of nutrition in medical training programmes.
Individual capacity	Included perception of capacity, knowledge, skills of Anganwadi Workers, ASHAs, mothers and families	Frontline worker (FLW) capacity was a key focus of the Mission and related initiatives occurring under ICDS and Health programmes. Some stakeholders noted that whilst some FLW knowledge had increased, practices would take longer to change – e.g. in the case of the delivery of successful behavioural change for infant feeding
Resources (financial)	Resourcing for nutrition/ lack of resources.	The Mission's small size, staff and budget were raised by some as potentially questioning its success. A lack of financial resources was not otherwise mentioned as a barrier by stakeholders.

Fig. 5 (*continued*)

evidence, or had contributed to changing the overall framing or narratives on nutrition.[5]

According to several participants, the involvement of civil society had helped to raise awareness about child undernutrition, increase pressure and hold government officials accountable to the available data, thus contributing to the initial and dominant framings of the issue in the state. The Citizen's Alliance against Malnutrition[6] and the involvement and leadership of the state's Malnutrition Monitoring Committee were highlighted as being particularly prominent. But it was the work of smaller NGOs or activists working in some of the areas of high ST populations such as Aurangabad district (which had experienced the first child deaths) and which were seen as spurring on the first phase of local media coverage. One stakeholder explained how this media coverage had been central to the subsequent framing of the issue which resulted in political momentum:

> In a way you can say the media highlighted this whole issue of malnutrition and has sort of pushed the government into realising the seriousness of the problem and realising that something more has to be done for this. And in that even the ICDS itself now, the whole restructuring of ICDS is probably a result of this whole debate and the public consciousness about what needs to be done.

[5] For more on the importance of internal and external 'framing' see (Shiffman, 2010; Shiffman and Smith, 2007).

[6] The Citizen's Alliance against Malnutrition was a nationwide movement, started in 2004 by the journalist Neerja Choudhry, which brought together young parliamentarians to focus on areas of high nutritional burden. The visits drew a successful press response and the loose nit body has kept active at a national level, helping spur on a national nutrition survey and contributing to other national policy debates.

However, a number of participants raised concerns regarding this media and civil society portrayal of undernutrition as being primarily a problem of food insecurity. Whilst catalysing a political response, this simplified view of undernutrition was thought to have missed an important opportunity to raise the public's awareness of the multidimensional nature of undernutrition and the need for a multi-sectoral approach. Media coverage of child undernutrition was also criticised by a number of participants as being short-lived and overly focussed on the aftermath of tragic child deaths due to acute malnutrition. So whilst helpful in catalysing initial reactions, the *longer-term* role of the media in sustaining the public's interest in undernutrition and in actively holding the government accountable for their commitments towards the reduction of child undernutrition was perceived as limited. Raising the media's awareness and knowledge of the technicalities of undernutrition was perceived as important to prevent future misrepresentations.

Despite these dominant media/public narratives, the Mission was seen as having helped shift the framing of undernutrition in technical or policy domains towards a recognition of the issue's inherent multi-dimensional challenges. To achieve this reframing the Mission was seen to have drawn on scientific data to highlight the problem and to have used evidence-based knowledge to promote the most effective interventions to address it at higher bureaucratic levels and amongst health and nutrition professionals in the community. More widely, the available data from both ground level monitoring and from the wider state surveys (including the National Family Health Survey III, from which data started to appear in 2007/8 and which highlighted the poor figures in the state) were also recognised as having played a key role in shaping the response in the state.

At a bureaucratic level, this scientific credibility was seen as a critical point in reinforcing the Mission's bureaucratic power, with one Mission insider commenting that "unless we are seen to be very, very reliable and credible, and whatever we say is based on scientific evidence it will be almost impossible to get the cooperation of the full departments". The backing and support of UNICEF was seen as crucial in this latter role, with the Mission and UNICEF seen as functioning together to be seen as a conduit for global evidence by a number of participants.

5.2. Political economy of stakeholders, ideas and interests

The State's Nutrition Mission was perceived both as an expression of political will towards tackling undernutrition and an important structure for governing its response by many (although not all) respondents. The Mission's bureaucratic set up and governance structure were seen as essential for its influence. This included its financial independence from normal government departments and yet its ability to hold sway over departmental policy and operations. The Mission's only substantial costs were on staff, which were met by UNICEF – and so the Mission was spared the usual bureaucratic procedures to access funds. Participants also placed a particularly strong emphasis on the decision that had been taken to ensure the Mission had no role in the procurement and food distribution associated with the existing ICDS (including e.g. the supplementary nutrition programme and take home rations), which kept Mission officials at a safe distance from any concerns to do with corruption:

> we decided not to take issues which could bring us in conflict with vested interest. Food is a very highly vested interest area. You're going to find that all sorts of vested interests are going to come into it, starting with your public corporations, private traders and so on.

Executive support was perceived as having helped to support and create a space for the bureaucratic functioning of the Mission and its organisational structures – which were themselves associated with effective horizontal and vertical co-ordination. Ranking as a secretary, the Mission's Director General (DG) was on a par with peers running the Health Department (responsible for the NRHM) and the Women and Child Development Department (WCD – the department responsible for the ICDS). The Mission specifically avoided trying to create a parallel structure to either department's organisational 'machinery' (its organisational structures and personnel), but instead to work through that machinery. Multi-sectoral committees operated at a Cabinet level (chaired by the CM and meeting once a year) and a senior bureaucratic level (chaired by the Chief Secretary or the Deputy Chief Secretary and meeting monthly). Both included representatives from a range of departments seen as critical to the response. In addition to Health and Women and Child Development they included, for example, the Departments of Water Supply and Sanitation and Tribal Development. However, one of the top Mission officials noted that their ability to influence at this level was not unlimited. Co-ordination had been difficult in the earlier period of the Mission's functioning and could still result in 'turf wars' - particularly over harnessing resources at the front line. And whilst the roles of other governmental Departments may have been important in terms of wider underlying drivers associated with the decline in stunting (particularly e.g. sanitation), these were not strongly discussed by the majority of participants as having figured in deliberate multisectoral action. But despite these limitations, the Mission was seen to be an effective operator in terms of this state level horizontal co-ordination – a result partly attributed to the aforementioned political support and structures, but partly also down to the skills and abilities of the Mission's DGs.

That this bureaucratic structure represented political will, power and genuine bisectoral co-ordination was said to be evidenced by a number of key decisions participants could point to in which the Mission had a documented role. These included, for example, a decision in the early days of the Mission to shift the focus to monitoring severe acute malnutrition (SAM) and referring such children to CDCs and (from 2010), treating children in the community in the VCDCs through both the health department and the ICDS machinery. Likewise, the decision to include monitoring of chronic undernutrition through monitoring stunting was also seen as a key result:

> Internationally, height is what is being measured so it is through our own soft power as we call it, persuasive powers, we have persuaded Anganwadi workers to do this job. It's not technically or officially a part of their mandate.

Related to the ability of the mission to co-ordinate or deliver vertically, many of the participants attributed the decline in undernutrition at least partly to the success of Maharashtra's improved health service delivery via the Public Health Department (PHD). Health programmes were seen as having received high level support (including from the current Chief Secretary) and increased resources. This expansion of primary and auxiliary care, the launch of the NRHM and the integration of these services with ICDS ground level delivery were also seen as key factors in the decline in stunting. Successful integration was thought to have been partly attributable to the bureaucratic structures initiated by the Mission - the most senior official interviewed noted the "extraordinary co-ordination between the PHD and the ICDS ". An activist clinician similarly reflected how "the Nutrition Mission [...] tried to combine the existing health services that the government had together [...] so you know [...] make use of whatever is available."

6. Capacity and resources

Political and public leadership on nutrition within the state were seen as having being present right from the top. This was viewed by some as simple political expediency (the original child deaths being in the Chief Minister's electoral district and/or the pressure represented by the High Court). Others, however, believed this extended to an expression of genuine political will or even a willingness to take a political risk, in continuing to support the Mission and the data gathering exercise that accompanied it. This political support was seen to have had continued following the death of Chief Minister through to the present incumbent (at the time of the research), the latter whom was interviewed for this study.

The subject that most animated the current and past Mission staff was their ability to innovate, influence and motivate at the ground level. A small number of external stakeholders expressed doubts over the plausibility of the claim that the Mission's secretariat's small staff of ten bureaucrats could have had an impact on nutrition in the state or sufficient control over the thousands of community level workers in either the ICDS or the NRHM. But the majority of participants (including both internal and external commentators) remained positive about what the Mission had been able to achieve despite these constraints.

The leaders of the Mission were seen as unique amongst their rank for their willingness to get out and speak to ground level workers and villagers. The majority of the small Mission secretariat were also continuously engaged in field visits in an extensive programme of capacity building accompanying the growth monitoring and community activities described above. As one external stakeholder noted:

> once you have a leadership at the top that is convinced, then it filters down, then the community will want to do something [and the government] machinery doesn't miss it. And I remember I visited [inaudible – Aurangabad?] about a year ago and the local official said to me "we used to think nothing can [help and] suddenly we feel we can actually make a difference to the life of children".

Mission officials discussed a number of strategies they had used to ensure this ground level motivation, including awards for highly performing AWCs; and letters from the Chief Secretary sent to frontline officials. As another external interviewee connected with the Mission commented:

> And they were really young officers who really enjoyed working because they were [gaining] recognition...[and on the recommendation of the Mission DG they were] getting a letter from the Chief Secretary [...] So they become your ambassadors. [...] You are creating people who are committed to this cause

The ability for public functionaries to display leadership at lower administrative levels was noted by other participants who felt the Mission gave district level officials - for example those with the responsibility for ICDS - the ability to focus on nutrition in the widest possible sense (e.g. including support for breastfeeding). This was contrasted with the focus on delivering supplementary nutritional support to children (via cooked meals and take-home rations) which has become the overriding focus of much of the ICDS programme. Alongside this, a number of independent participants confirmed witnessing changes in practices on the ground as a result of Mission activities – including the motivation of AWWS and mid-level workers, the sensitisation of AWWs, the adoption of new practices and the visibility of undernutrition at a community level.

At a ground level, several participants, within and outside of government, clearly highlighted the importance of building the capacity of health workers to recognise, prevent and treat undernutrition in an effective and timely manner. Nutrition was reported to have been introduced into the medical curricula for health professionals in most universities and colleges across Maharashtra in the previous 5 years. This was accompanied by making available further education courses on nutrition to medical personal at all levels. Joint training and capacity building with district health ICDS and NRHM workers (AWWs and ASHAs) were also reported to have been carried out at the ground level by the Mission and UNICEF.

Some of the success in bringing together the ground-level machinery of government can be attributed to national initiatives such as the institution of monthly Village Health and Nutrition Days, designed to ensure services provided by health and nutrition workers can be accessed and delivered simultaneously. But other forms of convergence appear to be particular to Maharashtra and at the instigation of the Mission – including the operation of the community treatment of acute malnutrition via the Village Child and Development Centres. District public health clinicians interviewed confirmed the improvements that were attributed to the introduction of the VCDCs and the delivery of resources via the NRHM – noting "Earlier we were trying to achieve malnourishment [reduction] without funds, which was very difficult. Now there are funds available and there is a machinery in place which promotes accountability. Therefore we are seeing good results".

Several participants had observed and described in detail the positive impact of the NRHM and wider health programmes or reforms on antenatal care and the number of institutional deliveries in rural areas. Maharashtra's success in increasing the numbers of institutional deliveries was seen as an entry point to a wider system of maternal and child care.

Participants also noted that the 60,000 strong "army" of Accredited Social Health Activists (ASHAs) introduced via the NRHM had made a considerable difference to the frontline resources. They were seen as having played an essential role in the effective and smooth implementation of various health programmes alongside and in providing support to the AWWs and to Auxiliary Nurse Midwives, who operated locally.

However, a focus group discussion with ASHAs revealed many of the capacity, resource and operational challenges they face on the ground, including: the performance-based payment structure that frequently provoked them to focus on activities that were remunerated (e.g. institutional delivery) at the expense of neglecting other tasks; the ongoing burden of high workloads; and the problems caused by delayed payments for work undertaken.

7. Discussion

Through interviews and examining other documents available on the States of Maharashtra's approach to undernutrition we have traced the events and factors present in the policy environment perceived to be associated with the state's particularly high rate of reduction of child stunting in 2006–2012. These events have been brought together into a timeline of key events (Fig. 4) and wider factors reported under the basic headings of the UNICEF framework and the further headings of the Lancet framework on enabling environments (Gillespie et al., 2013), which are summarised in Figs. 3 and 5 and discussed above. Here we reflect on a smaller set of findings of wider relevance to the theoretical and empirical base.

A key reinforcement of the wider literature in this field is the importance attributed within our analysis of the *framing, generation and communication of knowledge and evidence*. Evidence was highlighted in the stress participants placed on the Mission's role in translating international evidence (the focus on the <3 s, the

shift to a focus on maternal nutrition in the second phase of the Mission) into locally relevant policy. Framing was clear in the wider public mood we have highlighted in terms of the media, civil society and judicial action and also in the way stakeholders described how at least the technical/policy narrative had shifted from a 'food first bias' (Pelletier et al., 1995) to a wider understanding of evidence. But also important was the role of data itself – locally collected and locally credible - in highlighting the problem, where progress was being made and where gaps remained and still persevere to this day. Maharashtra stands practically alone as an Indian state possessing the political will to amass credible data (outside of national level surveys) on a critically important topic and moreover to use such data to publish and tailor its own policy recommendations (see Aguayo et al., 2016).

Analysis of the factors grouped under the heading of *political economy of stakeholders, ideas and interests* and overlapping with aspects of *capacity and resources* has underlined factors commonly highlighted in the wider literature, of political will and leadership (see Gillespie et al., 2013). But there is still a paucity of evidence on how leadership actually operates in case studies of success (Nisbett et al., 2015). According to key stakeholders in Maharashtra, political will and leadership were seen to be functioning *at* the top (in terms of State Secretariat structures) and at times *from* the top (in terms of individual leaders, from the Chief Minister down) – but equally the sources of leadership were lower down in the organisational structures – particularly e.g. the leadership shown at a divisional level in the form of the Marathwada initiative. This leadership was seen to have operated in three main dimensions: in the political and public spheres; in terms of bureaucratic organisation and innovation; and in organisational and motivational structures which reached to the frontline, where leadership that was inculcated in village level workers through the support given to and the focus on the community health workers, the ASHAs and the AWWs. The policy design and the day to day decisions did not come from the top, but political support was seen as creating both a conceptual space and the supporting bureaucratic structures (ie at cabinet level) that enabled the policy to be implemented. This occurred within a backdrop of wider public support and interest created by the media, civil society and judicial action to tackle the problem.

Horizontal and vertical coordination were built into this relationship between the Mission and its collaborators via the way it functioned through the bureaucratic machinery of the Health and WCD Departments at the state secretariat level and through 'convergence efforts' in terms of joint action of frontline workers on the ground. Whilst complex mulstistakeholder co-ordination platforms have been highlighted in global policy initiatives as critical factors in scaling up action,[7] the key story here appears as much one of bi-sectoral co-operation, facilitated by the Mission, between the WCD and Health departments.

The political and governance story is almost inseparable from our wider findings under *capacity and resources,* in so much as building capacity was not an afterthought to policy, but a key objective of policy. Increased capacity on the ground can be seen as both a key result of the Mission's strengthening activities and the injection of resources on the ground attributable to the NRHM. Policies focused both on training and motivating ground level workers; and on instilling a sense of responsibility for results (including the improved focus on growth monitoring and the onward referral or community treatment of more severe cases). Early igns that capacity was being addressed in a wider systemic sense (Potter and Brough, 2004)) are present on the focus on medical institution curricula and the generation of the Mission structure itself.

[7] See e.g. http://scalingupnutrition.org/wp-content/uploads/2014/03/Sun-in-Practice-issue-1.pdf.

Our stakeholder interviews focused extensively on the policy and political factors behind the decline in stunting, although stakeholders also mentioned several wider underderlying and basic drivers considered responsible for declines in stunting (Fig. 3). Whilst it is useful to report these factors, we have not tried to assess their credibility beyond what were able to triangulate between the stakeholders themselves (where the role of the Mission, the NRHM and wider economic growth were the most frequently mentioned) – though we note that these findings are consistent with some of the significant correlates of stunting declines reported in multivariate analyses reported elsewhere and described at the beginning of the paper (Aguayo et al., 2016; Haddad and Valli, 2014).

7.1. Limitations of the study

A study relying on 'stakeholder perspectives' is necessarily limited firstly to the types and numbers of stakeholders who are identified and consulted and secondly to the fact that what is reported remain perceptions, rather than a statement of factual occurrence. There is undoubtedly an element of recall bias – though we note that there was a strong level of 'narrative resonance' amongst the stakeholders in that the majority related similar stories of change during this period and accounts did not diverge strongly. However, whilst we sought out a breadth of participants and broader forms of evidence, we also relied strongly on the evidence of those connected with the government, with the Mission and with UNICEF – the latter being the original sponsors of the study - to tell the internal story. This has its limitations and potential biases, which we mitigated by our selection of stakeholders from outside of government and more critical voices from within civil society; and via retention of editorial control by the authors. But further limitations include the focus primarily on Mumbai; as opposed to better understanding the story at the district level; or understanding the wider and notable backdrop of activism around the Right to Food which coincided with this period. Finally, whist we have focused on changes thought by stakeholders to relate to the changes in stunting, we have not been able to analysis why similar changes were not apparent in the state's wasting figures, even though much of the activities of the mission (including e.g. the VCDCs) were focused on reduction of such acute malnutrition.[8]

As noted at the beginning, this study did not happen in a vacuum and is able to draw on related work which has paid more attention to factors outside of the policy response to the wider determinants (Aguayo et al., 2016; Haddad and Valli, 2014). Ideally such studies should be read in conjunction to provide a detailed account of wider determinants and related policy and programmatic factors, but neither approach can conclusively link what happened in the policy environment with related changes in outcomes. The aim instead should be (and has been) to identify particular policy processes, ideally traced through to the ground level, which can be plausibly associated with some of the changes in determinants.

8. Conclusions and wider implications

Maharasthra's decline in child stunting happened in the context of a number of other factors (including rising GDP and improve-

[8] Some stakeholders did make the link between wasting and stunting and felt that the stunting reductions had been an unanticipated outcome of focusing on acute malnutrition. However, there was strong evidence of the Mission and the technical support provided by UNICEF also having an equally strong focus on stunting – which included the rare decision to measure linear growth amongst children as part of routine growth monitoring. Again, we do not suggest that the stunting reductions were a causal outcome of such a focus, but note its relevance to the policy environment reported here.

ments in sanitation) which have been identified elsewhere (Aguayo et al., 2016; Haddad and Valli, 2014) as significantly correlated with the decline. No doubt the enabling environment encountered here was not in itself sufficient to drive all contributory changes, and nor was it intended to. But if one begins from the conclusion – which is also evidenced by multi-country correlational studies (Smith and Haddad, 2015) - that an enabling policy and political environment is necessary for a rapid and sustainable reduction in undernutrition beyond what GDP growth alone will reach, then there is value in qualitatively exploring the findings here on how such factors might play out in policy context at a sub-national level.

Considering the factors and actions we have listed under the three headings of the Lancet 'enabling environment' framework (Gillespie et al., 2013), there are a number of implications for wider studies and similar contexts which we summarise here.

Firstly, we find the role of the Nutrition Mission highlighted in nearly all stakeholder views. They stressed its role as an interdepartmental nutrition body focussed on strengthening ground level capacity, led by respected senior bureaucrats with the power to advocate for nutrition at all levels of the government, creating space for leadership lower down. This specific model of the Nutrition Mission may well be one that might work in other Indian states or in similar situations, and a number of such initiatives are now in operation in other Indian states (Raykar and Menon, 2016). More widely, this finding supports similar conclusions on the need for real (rather than purely rhetorical) executive level support and effective multisectoral co-ordination (including e.g. (Mejia Acosta and Fanzo, 2012). Importantly, we have detailed here a number of ways in which such leadership and co-ordination might function systemically, rather than existing only at the top.

Secondly, the various actions which we summarise under the three 'enabling environment' headings were found to be highly synergistic – so to trace one potential pathway through to ground level impact: first, the impetus for political action occurred at both state level and district level via the initial framing of child deaths by civil society and the media; second, the programmatic response was specifically focussed on increasing capacity (at both state wide co-ordinating level and at ground level); and third, this was combined with a strategy to harness both global evidence and local MIS data to further catalyse both political will and motivation at the front line. Looking for these synergies in other contexts might be important – but so might be deliberately creating and exploiting them as a specific strategy, as appeared to have happened here.

Thirdly, whilst we stress this multi or inter- sectorality in tackling a set of complex problems which together result in high levels of undernutrition, we also find that the current global policy focus on bringing as many actors together as possible in co-ordinating bodies may be missing some of the 'lower hanging fruit' of a smaller number of sectors or departments co-operating on a simpler and shared inter-sectoral agenda, as appears to have been the case here. Further diagnostic work would be necessary in each specific context to work out where the collaborations might be most effective –but over-elaborate plans to ensure that absolutely every sector is represented in such bodies might well be a diversion of administrative resources in many scarce contexts.

Acknowledgements

This project was funded by UNICEF India. We are extremely grateful to all participants for giving up their time to be interviewed. UNICEF Maharashtra, India and South Asia offices provided much-appreciated support along the way and we are grateful for their comments on the papers forming this report, particularly to Victor Aguayo, France Begin and Raji Nair. We are also grateful to Alex Cornelius, Rupinder Kaur, and particularly to Shilpi Srivastava for their research assistance, to Leah Plati for project coordination, to Tina Nelis for editorial support; and to Shilpa Deshpande, who provided helpful background on nutrition in Maharashtra and the work of the Mission. All errors and omissions remain those of the authors.

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